CLAIMS

What is claimed is:

1. A method for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising the steps of:

a) specifying the type of the antigen displayed by the pathogenic cell;

b) providing a supply of monoclonal antibodies specific against the specified antigen;

c) blocking the carboxy-terminal ends of the light and heavy chains of the monoclonal antibodies provided in step (b), followed by digesting the monoclonal antibodies by Papain enzyme to yield (Fab) antibody fragments with blocked carboxy-terminal ends of their light chains;

d) providing a supply of alpha-helix shaped chain linkers;

e) linking the amino-terminal ends of the alpha-helix shaped chain linkers provided in step (d) to the carboxy-terminal ends of the heavy chains of the (Fab) antibody fragments provided in step (c), through peptide bonds;

f) providing a supply of light chains of linking (Fab) antibody fragments;

g) linking the amino-terminal ends of the light chains of the linking (Fab) antibody fragments provided in step (f) to the carboxy-terminal ends of the alpha-helix shaped chain linkers included in the complexes prepared in step (e), through peptide bonds;

h) providing a supply of foreign class I MHC molecules;

i) providing a supply of heavy chains of linking (Fab) antibody fragments;

j) linking the amino-terminal ends of the heavy chains of the linking (Fab) antibody fragments provided in step (i) to the carboxy-terminal ends of the foreign class I MHC molecules provided in step (h), through peptide bonds;

k) joining the light chains of the linking (Fab) antibody fragments included in the complexes prepared in step (g) with the heavy chains of the linking (Fab) antibody fragments included in the complexes prepared in step (j), through disulfide bonds;

l) sensitizing the mammal against the foreign class I MHC molecules provided in step (h); and

m) administering the compound protein molecules prepared in step (K) to the mammal.

2. The method of claim 1 wherein the mammal is a man.

3. The method of claim 1 wherein the pathogenic cell is a virus-infected cell.

4. The method of claim 3 wherein the administration of the compound protein molecules prepared in step (k) to the mammal is preceded by suppression of the reproduction cycle of the pathogenic virus.

5. The method of claim 1 wherein the pathogenic cell is a cancerous cell.

6. The method of claim 5 wherein the compound protein molecules prepared in step (k) are administered by spraying within an open wound during an operation conducted to excise the main bulk of the tumor.

7. The method of claim 1 wherein the compound protein molecules prepared in step (k) are administered by intravenous injection.

8. A method for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising the steps of:

a) specifying the type of the antigen displayed by the pathogenic cell;

b) providing a supply of monoclonal antibodies specific against the specified antigen;

c) blocking the carboxy-terminal ends of the light and heavy chains of the monoclonal antibodies provided in step (b), followed by digesting the monoclonal antibodies by Pepsin enzyme to yield (Fab'2) antibody fragments with blocked carboxy-terminal ends of their light chains;

d) providing a supply of alpha-helix shaped chain linkers;

e) linking the amino-terminal ends of the alpha-helix shaped chain linkers provided in step (d) to the carboxy-terminal ends of the heavy chains of the (Fab'2) antibody fragments provided in step (c), through peptide bonds;

f) providing a supply of light chains of linking (Fab) antibody fragments;

g) linking the amino-terminal ends of the light chains of the linking (Fab) antibody fragments provided in step (f) to the carboxy-terminal ends of the alpha-helix shaped chain linkers included in the complexes prepared in step (e), through peptide bonds;

h) providing a supply of foreign class I MHC molecules;

i) providing a supply of heavy chains of linking (Fab) antibody fragments;

j) linking the amino-terminal ends of the heavy chains of the linking (Fab) antibody fragments provided in step (i) to the carboxy-terminal ends of the foreign class I MHC molecules provided in step (h), through peptide bonds;

k) joining the light chains of the linking (Fab) antibody fragments included in the complexes prepared in step (g) with the heavy chains of the linking (Fab) antibody fragments included in the complexes prepared in step (j), through disulfide bonds;

l) sensitizing the mammal against the foreign MHC molecules provided in step (h); and

m) administering the compound protein molecules prepared in step (K) to the mammal.

9. The method of claim 8 wherein the mammal is a man.

10. The method of claim 8 wherein the pathogenic cell is a virus-infected cell.

11. The method of claim 10 wherein the administration of the compound protein molecules prepared in step (k) to the mammal is preceded by suppression of the reproduction cycle of the pathogenic virus.

12. The method of claim 8 wherein the pathogenic cell is a cancerous cell.

13. The method of claim 12 wherein the compound protein molecules prepared in step (k) are administered by spraying within an open wound during an operation conducted to excise the main bulk of the tumor.

14. The method of claim 8 wherein the compound protein molecules prepared in step (k) are administered by intravenous injection.

15. A method for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising the steps of:

a) specifying the type of the antigen displayed by the pathogenic cell;

b) providing a supply of monoclonal antibodies specific against the specified antigen;

c) blocking the carboxy-terminal ends of the light and heavy chains of the monoclonal antibodies provided in step (b), followed by digesting the monoclonal antibodies by Papain enzyme to yield (Fab) antibody fragments with blocked carboxy-terminal ends of their light chains;

d) providing a supply of alpha-helix shaped chain linkers;

e) linking the amino-terminal ends of the alpha-helix shaped chain linkers provided in step (d) to the carboxy-terminal ends of the heavy chains of the (Fab) antibody fragments provided in step (c), through peptide bonds;

f) providing a supply of heavy chains of linking (Fab) antibody fragments;

g) linking the amino-terminal ends of the heavy chains of the linking (Fab) antibody fragments provided in step (f) to the carboxy-terminal ends of the alpha-helix shaped chain linkers included in the complexes prepared in step (e), through peptide bonds;

h) providing a supply of foreign class I MHC molecules;

i) providing a supply of light chains of linking (Fab) antibody fragments;

j) linking the amino-terminal ends of the light chains of the linking (Fab) antibody fragments provided in step (i) to the carboxy-terminal ends of the foreign class I MHC molecules provided in step (h), through peptide bonds;

k) joining the heavy chains of the linking (Fab) antibody fragments included in the complexes prepared in step (g) with the light chains of the linking (Fab) antibody fragments included in the complexes prepared in step (j), through disulfide bonds;

l) sensitizing the mammal against the foreign class I MHC molecules provided in step (h); and

m) administering the compound protein molecules prepared in step (K) to the mammal.

16. The method of claim 15 wherein the mammal is a man.

17. The method of claim 15 wherein the pathogenic cell is a virus-infected cell.

18. The method of claim 17 wherein the administration of the compound protein molecules prepared in step (k) to the mammal is preceded by suppression of the reproduction cycle of the pathogenic virus.

19. The method of claim 15 wherein the pathogenic cell is a cancerous cell.

20. The method of claim 19 wherein the compound protein molecules prepared in step (k) are administered by spraying within an open wound during an operation conducted to excise the main bulk of the tumor.

21. The method of claim 15 wherein the compound protein molecules prepared in step (k) are administered by intravenous injection.

22. A method for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising the steps of:

a) specifying the type of the antigen displayed by the pathogenic cell;

b) providing a supply of monoclonal antibodies specific against the

specified antigen;

c) blocking the carboxy-terminal ends of the light and heavy chains of the monoclonal antibodies provided in step (b), followed by digesting the monoclonal antibodies by Pepsin enzyme to yield (Fab'2) antibody fragments with blocked carboxy-terminal ends of their light chains;

d) providing a supply of alpha-helix shaped chain linkers;

e) linking the amino-terminal ends of the alpha-helix shaped chain linkers provided in step (d) to the carboxy-terminal ends of the heavy chains of the (Fab'2) antibody fragments provided in step (c), through peptide bonds;

f) providing a supply of heavy chains of linking (Fab) antibody fragments;

g) linking the amino-terminal ends of the heavy chains of the linking (Fab) antibody fragments provided in step (f) to the carboxy-terminal ends of the alpha-helix shaped chain linkers included in the complexes prepared in step (e), through peptide bonds;

h) providing a supply of foreign class I MHC molecules;

i) providing a supply of light chains of linking (Fab) antibody fragments;

j) linking the amino-terminal ends of the light chains of the linking (Fab) antibody fragments provided in step (i) to the carboxy-terminal ends of the foreign class I MHC molecules provided in step (h), through peptide bonds;

k) joining the heavy chains of the linking (Fab) antibody fragments included in the complexes prepared in step (g) with the light chains of the

linking (Fab) antibody fragments included in the complexes prepared in step (j), through disulfide bonds;

l) sensitizing the mammal against the foreign class I MHC molecules provided in step (h); and

m) administering the compound protein molecules prepared in step (K) to the mammal.

23. The method of claim 22 wherein the mammal is a man.

24. The method of claim 22 wherein the pathogenic cell is a virus-infected cell.

25. The method of claim 24 wherein the administration of the compound protein molecules prepared in step (k) to the mammal is preceded by suppression of the reproduction cycle of the pathogenic virus.

26. The method of claim 22 wherein the pathogenic cell is a cancerous cell.

27. The method of claim 26 wherein the compound protein molecules prepared in step (k) are administered by spraying within an open wound during an operation conducted to excise the main bulk of the tumor.

28. The method of claim 22 wherein the compound protein molecules prepared in step (k) are administered by intravenous injection.

29. A compound protein molecule, used for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising:

1) a foreign class I MHC molecule, having an amino-terminal end and a carboxy-terminal end;

2) a (Fab) fragment of an antibody specific against the said antigen displayed on the outer surface of the pathogenic cell, and having an amino-terminal end and a carboxy-terminal end; and

3) intermediate linking means, by which the carboxy-terminal end of the said foreign class I MHC molecule is linked to the carboxy-terminal end of the said (Fab) antibody fragment.

30. A compound protein molecule, used for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising in sequence:

1) a foreign class I MHC molecule;

2) a linking (Fab) antibody fragment;

3) an alpha-helix shaped chain linker; and

4) a (Fab) fragment of an antibody specific against the said antigen displayed on the outer surface of the pathogenic cell.

31. A compound protein molecule, used for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising:

1) two foreign class I MHC molecules, each having an amino-terminal end and a carboxy-terminal end;

2) a (Fab'2) fragment of an antibody specific against the said antigen displayed on the outer surface of the pathogenic cell, and having two amino-terminal ends and two carboxy-terminal ends; and

3) intermediate linking means, by which the carboxy-terminal ends of the said foreign class I MHC molecules are linked to the carboxy-terminal ends of the said (Fab'2) antibody fragment.

32. A compound protein molecule, used for inducing a cytotoxic cell-mediated immune response in a mammal against a pathogenic cell displaying an antigen on its outer surface, comprising in sequence:

1) a foreign class I MHC molecule;

2) a linking (Fab) antibody fragment;

3) an alpha-helix shaped chain linker;

4) a (Fab'2) fragment of an antibody specific against the said antigen displayed on the outer surface of the pathogenic cell;

5) an alpha-helix shaped chain linker;

6) a linking (Fab) antibody fragment; and

7) a foreign class I MHC molecule.